



U.S. Fish & Wildlife Service

# Rufa red knot

## *Calidris canutus rufa*

Skilled aviator Rear Admiral Richard E. Byrd flew over both the North and South poles. But what this renowned man accomplished with the help of sled dogs, ships and airplanes, a little shorebird weighing less than a cup of coffee completes every year of its life. The red knot is truly a master of long-distance aviation.

On wingspans of 20 inches, some red knots fly more than 9,300 miles from south to north every spring and repeat the trip in reverse every autumn, making this bird one of the longest-distance migrants in the animal kingdom. About 9 inches long, red knots are about the size of a robin. Biologists have identified six subspecies, three of them living in the Western Hemisphere: *C.c. islandica*, *C.c. roselaari*, and *C.c. rufa*. This last, the red knot known as *rufa*, winters at the tip of South America in Tierra del Fuego, in northern Brazil, throughout the Caribbean, and along the U.S. coasts from Texas to North Carolina. The *rufa* red knot breeds in the tundra of the central Canadian Arctic from northern Hudson Bay to the southern Queen Elizabeth Islands.

Surveys of wintering knots along the coasts of southern Chile and Argentina and during spring migration in Delaware Bay on the U.S. coast indicated a serious population decline in the early 2000's.

*A red knot banded in May 1987 was seen on Delaware Bay in May 2000. During those 13 years, the bird had flown about 242,350 miles, a distance farther than from the earth to the moon.*



Greg Breese/USFWS

*Red knot*

Biologists from the U.S. Fish and Wildlife Service, state natural resource agencies, and non-profit organizations all share a concern for the *rufa* red knot and are pooling efforts to identify what needs to be done to prevent further losses.

### Strength in numbers

Red knots winter and migrate in large flocks containing hundreds of birds. While we can guess at some of the benefits of traveling in large flocks, such as protection from predators, we can also see the downside - susceptibility to habitat change and loss, oil spills, toxins, red tides, diseases, collisions with wind turbines, storms, and hunting. Red knots were heavily hunted in the early 20th century, and may have never recovered in eastern North America. Knots are still hunted in parts of the

Caribbean and South America.

### Eating like a bird

For much of the year red knots eat small clams, mussels, snails and other invertebrates, swallowing their prey whole – shell and all. Migrating knots can complete nonstop flights of 1,500 miles and more, converging on critical stopover areas to rest and refuel along the way. In order to endure their long journeys, red knots undergo extensive physical changes. Flight muscles enlarge, while leg muscles shrink. Stomachs and gizzards decrease, while fat mass increases by more than 50 percent. Due to these physical changes, knots arriving from long migration flights are not able to feed maximally until their digestive systems regenerate, a process that may take several days. Thus, migrating birds require stopover

habitats rich in easily digested foods – with thin or no shells – in order to gain enough weight to fuel the next flight. In spring, migrating knots seem to follow a northward “wave” in quality prey – by timing their stopovers with the spawning seasons of intertidal invertebrates, knots take advantage of readily digestible food resources like juvenile clams and mussels and horseshoe crab eggs. Red knots arrive at stopover areas very thin, sometimes emaciated. They eat constantly to gain enough weight to continue their journeys, adding up to 10 percent of their body weight each day and nearly doubling their weight during some stopovers.

#### **Requirements for survival**

The red knot’s unique and impressive life history depends on suitable habitat, food, and weather conditions at far-flung sites across the Western Hemisphere, from the extreme south of Tierra del Fuego to the far north of the central Canadian Arctic. Further, red knots

need to encounter these favorable habitat, food, and weather conditions within narrow seasonal windows as the birds hopscotch along migration stopovers between wintering and breeding areas. For example, the red knot population decline that occurred in the 2000s was caused primarily by reduced food availability from increased harvests of horseshoe crabs, exacerbated by small changes in the timing that red knots arrived at the Delaware Bay. Red knots may also be particularly vulnerable to global climate change, which is likely to affect the arctic tundra ecosystem where the knots breed; the quality and quantity of coastal habitats due to rising sea levels; the quantity and timing of invertebrate food resources throughout the bird’s range; and the severity, timing, and location of storm and weather patterns.

Horseshoe crab harvests are now managed with explicit goals to stabilize and recover red knot populations; red knot number appear to have stabilized

in the past few years, but at low levels relative to earlier decades. Red knots fascinate biologists, bird watchers and people who appreciate the complex beauty of the natural world. Together with these partners, the U.S. Fish and Wildlife Service is dedicated to working to conserve this extraordinary bird.

**Raleigh Field Office**  
**U.S. Fish and Wildlife Service**  
**P.O. Box 33726**  
**Raleigh, NC 27636-3726**  
**<http://Raleigh.fws.gov>**

**Federal Relay Service**  
**for the deaf and hard-of-hearing**  
**1 800/877 8339**

**U.S. Fish and Wildlife Service**  
**<http://www.fws.gov>**  
**1 800/344 WILD**

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*Red knots at Cape Lookout National Seashore*